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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,520	10/15/2003	Mee-Ae Ryu	P56897	4180

7590 09/21/2005

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EXAMINER	
SANEI, HANA ASMAT	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/684,520	RYU ET AL.
	Examiner	Art Unit
	Hana A. Sanei	2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06/04/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) *18-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17 and 24-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/15/03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Request for Corrected Filing Receipt, filed on 6/4/04, has been entered and acknowledged by the Examiner.

Election/Restrictions

2. Applicant's election with traverse of Group I, including claims 1-17 and 24-38 in Application No. 10/684520, filed on 8/29/05 is acknowledged. The traversal is on the ground(s) that:

a. The subject matter of the groups overlap

b. It is not shown that a serious burden exists on the examiner

This is not found persuasive for the following reasons:

With regard to the first item, applicant's traverse on the grounds that the two groups overlap is not found to be persuasive because Group II specifically mentions method of layer formation, which has no overlap to structural elements of the field emission display described in Group I.

With regard to the second item, applicant's traverse on the grounds that it is not shown that a serious burden exists on the examiner is not found to be persuasive because applications that claim inventions in different statutory categories of invention, only a one-way distinctness is generally required to support a restriction requirement. See MPEP 806.05(f). Consequently, in the instant case, neither a showing of undue burden, nor that the claims are both independent and distinct is required to support a restriction requirement. Furthermore, the separate statutory classification of invention,

and the different fields of search, are indicia of an undue burden. See MPEP 808.02 and MPEP 803(B).

Consequently, requirement is still deemed proper and is therefore made FINAL. This application contains claims 18-23 drawn to an invention nonelected with traverse in Application No. 10/684520. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144). See MPEP 821.01

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> **A person shall be entitled to a patent unless –**
>
> **(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.**

4. Claims 1, 5-6, 8-10, 15, 24-29, 31-33, 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Uemura et al (US 6239547 B1).

With respect to Claim 1, Uemura discloses a field emission display (Figure 4), comprising: first (faceplate, 402) and second substrates (ceramic substrate, 406a) provided opposing one another with a predetermined gap there between to form a vacuum assembly (Col. 7, lines 4-6); electron emission sources (421) provided on one of the first and second substrates; an electron emission inducing assembly (406b)

inducing the emission of electrons from the electron emission sources; and an illuminating assembly (phosphor screen, 404) provided on the other one of the first and second substrates not including the electron emission sources being formed, the illuminating assembly realizing images by the emission of electrons from the electron emission sources, with the electron emission sources including a carbon nanotube layer (421) and a base layer (conductive adhesive, 422), the base layer connecting the carbon nanotube layer to the one of the first and second substrates on which the electron emission sources are provided and having conductibility for applying a voltage to the carbon nanotube layer required for the emission of electrons, and with the base layer having a predetermined thickness, and the carbon nanotube layer being provided on the base layer in a state substantially un-mixed with the base layer (Figure 4).

With respect to Claim 5, Uemura teaches a that the base layer (conductive adhesive, 422) includes an adhesive material having conductibility selected from the group consisting of silver, nickel, aluminum, gold, cobalt, and iron (silver, Col. 7, lines 29-31).

With respect to Claim 6, Uemura teaches a that the base layer (conductive adhesive, 422) includes a metal conductive material selected from the group consisting of silver adhesive material having conductibility selected from the group consisting of silver (Col. 7, lines 29-31).

With respect to Claim 8, Uemura teaches that the base layer (703, Figure 7) has an outer surface that includes prominences and depressions (see Figure 7).

With respect to Claim 9, Uemura teaches that the base layer includes spherical particles with a diameter of 0.05 to 5 μm (Col. 11, lines 65-67).

With respect to Claim 10, Uemura teaches that the spherical particles are conductive metal particles selected from the group consisting of silver, copper, and aluminum (Col. 11, lines 65-67).

With respect to Claim 15, the claim is rejected over the reasons stated in the rejections of claim 1 & 9.

With respect to Claim 24, the claim is rejected over the reasons stated in the rejection of claim 1.

With respect to Claim 25, the claim is rejected over the reasons stated in the rejection of claim 24 & 1.

With respect to Claim 26, the claim is rejected over the reasons stated in the rejection of claim 24 & 1.

With respect to Claim 27, the claim is rejected over the reasons stated in the rejection of claim 25 & 1.

With respect to Claim 28, the claim is rejected over the reasons stated in the rejection of claim 24 & 5.

With respect to Claim 29, the claim is rejected over the reasons stated in the rejection of claim 24 & 6.

With respect to Claim 31, the claim is rejected over the reasons stated in the rejection of claim 24 & 8.

With respect to Claim 32, the claim is rejected over the reasons stated in the rejections of claim 24 & 9.

With respect to Claim 33, the claim is rejected over the reasons stated in the rejections of claim 24 & 10.

With respect to Claim 38, the claim is rejected over the reasons stated in the rejections of claim 24 & 9.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-2, 4, 24-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakada et al. (US 6455989 B1).

With respect to Claim 1, Nakada teaches discloses a field emission display (Figure 3), comprising: first (11) and second substrates (2) provided opposing one another with a predetermined gap there between to form a vacuum assembly; electron emission sources (202) provided on one of the first and second substrates; an electron emission inducing assembly (13) inducing the emission of electrons from the electron emission sources; and an illuminating assembly (phosphor, Col. 7, lines 35-38) provided on the other one of the first and second substrates not including the electron emission sources being formed, the illuminating assembly realizing images by the emission of electrons from the electron emission sources, with the electron emission sources including a carbon nanotube layer (Figure 6, 16a) and a base layer (projecting structure 161), the base layer connecting the carbon nanotube layer to the one of the first and

second substrates on which the electron emission sources are provided and having conductibility for applying a voltage to the carbon nanotube layer required for the emission of electrons, and with the base layer having a predetermined thickness, and the carbon nanotube layer being provided on the base layer in a state substantially un-mixed with the base layer (Figure 6).

With respect to Claim 2, Nakada teaches that the electron emission inducing assembly (Figure 3) comprises cathode electrodes formed in a stripe pattern on one of the first and second substrates having the electron emission sources being provided on an outer surface of the cathode electrodes (13); an insulating layer formed covering the cathode electrodes at all areas except where the electron emission sources are formed (14); and gate electrodes formed on the insulating layer in a stripe pattern and in a direction substantially perpendicular to the cathode electrodes (15), the gate electrodes including holes for exposing the electron emission sources.

With respect to Claim 4, Nakada teaches that the illuminating assembly comprises an anode electrode formed on the substrate on which the electron emission are not formed; and phosphor layer formed on an outer surface of the anode surface (Col. 7, lines 35-38).

With respect to Claim 24, the claim is rejected over the reasons stated in the rejection of claim 1.

With respect to Claim 25, Nakada teaches a second substrate (2) provided opposing the first substrate with a predetermined gap there between to form a vacuum assembly.

With respect to Claim 26, Nakada teaches an electron emission inducing assembly (13) inducing the emission of electrons from the electron emission sources.

With respect to Claim 27, Nakada teaches an illuminating assembly (phosphor, Col. 7, lines 35-38) provided on the other one of the second substrate (2), the second substrate not including the electron emission sources being formed, the illuminating assembly realizing images by the emission of electrons from the electron emission sources.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakada et al. (US 6455989 B1) in view of Choi et al. (US 2001/0006232 A1).

With respect to Claim 3, Nakada teaches the invention set forth above (see rejection in Claim 1 above). Nakada is silent lacks the specific structure of the gate electrode disposed on a first substrate. In the same field of endeavor, Choi teaches a teaches that the gate electrodes (Figure 2, #13) are formed in a stripe pattern on one of the first and second substrates (11) provided with the electron emission sources (15); an insulating layer (17) formed over an entire surface of one of the first and second substrates provided with the electron emission sources and covering the gate electrodes; and cathode electrodes (12) formed on the insulating layer in a stripe

pattern and in a direction substantially perpendicular to the gate electrodes, the electron emission sources being formed on an outer surface of the cathode electrodes in order to ensure easier manufacturing of such an FED device (Page 4, Par [0043]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify the structure of the electron emission inducing assembly, as disclosed by Choi, in the field emission display of Nakada. Motivation to combine would be to ensure easier manufacturing of such an FED device.

7. Claims 5-6, 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakada et al. (US 6455989 B1) in view of Uemura et al. (US 6239547 B1).

With respect to Claim 5, Nakada teaches the invention set forth above (see rejection in Claim 1 above). Nakada is silent regarding the composition of the base layer. In the same field of endeavor, Uemura teaches a that the base layer (conductive adhesive, 422) includes an adhesive material having conductibility selected from the group consisting of silver, nickel, aluminum, gold, cobalt, and iron (silver, Col. 7, lines 29-31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from one of the materials disclosed by Uemura, since it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use. See MPEP 2144.07.

With respect to Claim 6, Nakada teaches the invention set forth above (see rejection in Claim 1 above). Nakada is silent regarding the composition of the base layer. In the same field of endeavor, Uemura teaches a that the base layer (conductive adhesive, 422) includes a metal conductive material selected from the group consisting

of silver adhesive material having conductibility selected from the group consisting of silver (Col. 7, lines 29-31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from one of the materials disclosed by Uemura, since it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use. See MPEP 2144.07.

With respect to Claim 28, Nakada teaches the invention set forth above (see rejection in Claim 24 above). Nakada is silent regarding the composition of the base layer. In the same field of endeavor, Uemura teaches a that the base layer (conductive adhesive, 422) includes an adhesive material having conductibility selected from the group consisting of silver, nickel, aluminum, gold, cobalt, and iron (silver, Col. 7, lines 29-31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from one of the materials disclosed by Uemura, since it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use. See MPEP 2144.07.

With respect to Claim 29, Nakada teaches the invention set forth above (see rejection in Claim 24 above). Nakada is silent regarding the composition of the base layer. In the same field of endeavor, Uemura teaches a that the base layer (conductive adhesive, 422) includes a metal conductive material selected from the group consisting of silver adhesive material having conductibility selected from the group consisting of silver (Col. 7, lines 29-31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from one of the materials

disclosed by Uemura, since it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use. See MPEP 2144.07.

8. Claims 7, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uemura et al. (US 6239547 B1) in view of Wada et al. (US 6525468 B1).

With respect to Claim 7, Uemura teaches that the base layer (Figure 2) comprises an adhesive material (conductive adhesive, Col. 5, lines 41-45) realized through a glass frit; and a metal conductive material (84) selected from the group consisting of silver, copper, and aluminum (silver paste, Col. 5, lines 41-45). Uemura lacks an frit glass from the group consisting of PbO, SiO_2, Ba_2O_3 . In the same field of Wada teaches that the base layer comprises an adhesive material (paste, Col. 1, lines 57-64) realized through a glass frit that selected from the group consisting of PbO, SiO_2, Ba_2O_3 (Col. 1, lines 57-64), and a mixture thereof. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from one of the materials disclosed by Wade, since it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use. See MPEP 2144.07.

With respect to Claim 30, the claim is rejected over the reasons stated in the rejections 24 & 7.

9. Claims 9-10, 15, 32-33, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakada et al. (US 6455989 B1) in view of Uemura et al. (US 2003/0127965).

With respect to Claim 9, Nakada teaches the invention set forth above (see rejection in Claim 1 above). Nakada is silent regarding the diameter of the base layer particles. In the same field of endeavor, Uemura teaches that the base layer includes spherical particles with a diameter of 0.05 to 5 μm (Page 3, Par [0035]) in order to ensure sufficient fluidity (Page 3, Par [0035]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify the particle diameter, as disclosed by Uemura, in the field emission display of Nakada. Motivation to combine would be to in order to ensure sufficient fluidity.

With respect to Claim 10, Nakada teaches the invention set forth above (see rejection in Claim 1 above). Nakada is silent regarding the composition of the base layer. In the same field of endeavor, Uemura teaches that the spherical particles are conductive metal particles selected from the group consisting of silver, copper, and (Page 3, Par [0035]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from one of the materials disclosed by Uemura, since it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use. See MPEP 2144.07.

With respect to Claim 15, Nakada teaches discloses a field emission display (Figure 3), comprising: first (11) and second substrates (2) provided opposing one another with a predetermined gap there between to form a vacuum assembly; electron emission sources (202) provided on one of the first and second substrates; an electron emission inducing assembly (13) inducing the emission of electrons from the electron

emission sources; and an illuminating assembly (phosphor, Col. 7, lines 35-38) provided on the other one of the first and second substrates not including the electron emission sources being formed, the illuminating assembly realizing images by the emission of electrons from the electron emission sources, with the electron emission sources including a carbon nanotube layer (Figure 6, 16a) and a base layer (projecting structure 161), the base layer connecting the carbon nanotube layer to the one of the first and second substrates on which the electron emission sources are provided and having conductibility for applying a voltage to the carbon nanotube layer required for the emission of electrons, and with the base layer having a predetermined thickness, and the carbon nanotube layer being provided on the base layer in a state substantially un-mixed with the base layer (Figure 6).

Uemura is silent regarding the diameter of the base layer particles. In the same field of endeavor, Nakada teaches that the base layer includes spherical particles with a diameter of 0.05 to 5 μm (Page 3, Par [0035]) in order to ensure sufficient fluidity (Page 3, Par [0035]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify the particle diameter, as disclosed by Nakada, in the field emission display of Uemura. Motivation to combine would be to in order to ensure sufficient fluidity.

With respect to Claim 32, Nakada teaches the invention set forth above (see rejection in Claim 24 above). Nakada is silent regarding the diameter of the base layer particles. In the same field of endeavor, Uemura teaches that the base layer includes spherical particles with a diameter of 0.05 to 5 μm (Page 3, Par [0035]) in order to

ensure sufficient fluidity (Page 3, Par [0035]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify the particle diameter, as disclosed by Uemura, in the field emission display of Nakada. Motivation to combine would be to in order to ensure sufficient fluidity.

With respect to Claim 33, Nakada teaches the invention set forth above (see rejection in Claim 24 above). Nakada is silent regarding the composition of the base layer. In the same field of endeavor, Uemura teaches that the spherical particles are conductive metal particles selected from the group consisting of silver, copper, and (Page 3, Par [0035]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from one of the materials disclosed by Uemura, since it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use. See MPEP 2144.07.

With respect to Claim 38, Nakada teaches the invention set forth above (see rejection in Claim 24 above). Nakada is silent regarding the diameter of the base layer particles. In the same field of endeavor, Uemura teaches that the base layer includes spherical particles with a diameter of 0.05 to 5 μm (Page 3, Par [0035]) in order to ensure sufficient fluidity (Page 3, Par [0035]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify the particle diameter, as disclosed by Uemura, in the field emission display of Nakada. Motivation to combine would be to in order to ensure sufficient fluidity.

10. Claims 14, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakada et al. (US 6455989 B1) in view of Lee et al. (US 2002/0175617 A1).

With respect to Claim 14, Nakada teaches the invention set forth above (see rejection in Claim 1 above). Nakada is silent regarding the thickness of the base layer. In the same field of endeavor, Lee teaches that the base layer (nanotube emitter layer, Figure 2, #52) is formed at a thickness of 0.05 to 5 μm (Page 3, Par [0016]) in order to ensure sufficient mechanical support of respective nanotubes. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify the thickness of the base layer, as disclosed by Lee, in the field emission display of Nakada. Motivation to combine would be to ensure sufficient mechanical support of respective nanotubes.

With respect to Claim 37, the claim is rejected over the reasons stated in the rejections of 24 & 14 (above).

11. Claims 8, 11, 16, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakada et al. (US 6455989 B1) in view of Cole et al. (US 6919730 B2).

With respect to Claim 8, Nakada teaches the invention set forth above (see rejection in Claim 1 above). Nakada is silent regarding prominence and depressions of the base layer. In the same field of endeavor, Cole teaches that of prominence and depressions on base layer (platforms, Col. 3, lines 17-27) in order to provide the ability to better control temperature response of a plurality of nanotubes to radiation. It should be noted that the Cole's temperature sensor (235) acts as a baseline surface for providing the platform-sensor combination with respective depressions. Therefore, it

would have been obvious to one of ordinary skill in the art, at the time of the invention, to add the prominence and depressions of the base layer, as disclosed by Cole, in the field emission display of Nakada. Motivation to combine would be to provide the ability to better control temperature response of a plurality of nanotubes to radiation.

With respect to Claim 11, Nakada teaches the invention set forth above (see rejection in Claim 1 above). Nakada is silent regarding the dimensions of the prominence and depressions of the base layer. In the same field of endeavor, Cole teaches that the prominence and depressions at 0.05 to 10 μm width, 0.01 to 5 μm depth, and 1 to 20 μm intervals (Col. 3, lines 17-27) in order to provide the ability to better control temperature response of a plurality of nanotubes to radiation. It should be noted that the Cole's temperature sensor (235) acts as a baseline surface for providing the platform-sensor combination with respective depressions. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify the dimensions of the prominence and depressions of the base layer, as disclosed by Cole, in the field emission display of Nakada. Motivation to combine would be to provide the ability to better control temperature response of a plurality of nanotubes to radiation.

With respect to Claim 16, the claim is rejected over the reasons stated in the rejection of claims 1 & 11.

With respect to Claim 34, the claim is rejected over the reasons stated in the rejection of claims 1 & 11.

12. Claims 12, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakada et al. (US 6455989 B1) in view of Cole et al. (US 6919730 B2) with further consideration to Mau et al. (US 6866801 B1).

With respect to Claim 12, Nakada-Cole teaches the invention set forth above (see rejection in Claim 1 above). Nakada-Cole is silent regarding the composition of the prominence and depressions of the base layer. In the same field of endeavor, Mau teaches that the prominence and depressions are formed of indium thin oxide or chrome (Col. 2, lines 65-67 – Col. 3, lines 1-8). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose from one of the materials disclosed by Mau, since it has been held to be within the general skill of the worker in the art to select a known material on the basis of its suitability for the intended use. See MPEP 2144.07.

With respect to Claim 35, the claim is rejected over the reasons stated in the rejection of claims 1 & 12.

13. Claims 13, 17, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakada et al. (US 6455989 B1) in view of Lee et al. (2002/0175618 A1).

With respect to Claim 13, Nakada teaches the invention set forth above (see rejection in Claim 1 above). Nakada is silent the respective densities of the base layer and carbon nanotube layer. In the same field of endeavor, Lee teaches a carbon nanotube density of the carbon nanotube layer being greater than the carbon nanotube density of the base layer (Page 3, Par [0018]) in order to improve electron emission characteristics. Therefore, it would have been obvious to one of ordinary skill in the art,

at the time of the invention, to modify the densities, as disclosed by Lee, in the field emission display of Nakada. Motivation to combine would be to improve electron emission characteristics.

Nakada-Lee teaches the claimed invention except for the specific limitation of the carbon nanotube density of the carbon nanotube layer being "100 to 1,000,000 times" a carbon nanotube density of the base layer. However, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide carbon nanotube density of the carbon nanotube layer being "100 to 1,000,000 times" a carbon nanotube density of the base layer, since optimization of workable ranges is considered within the skill of the art. Further, one of ordinary skill in the art would entertain the idea of providing a substantially greater amount of the carbon nanotubes in the carbon nanotube layer in order to ensure sufficient emission of the field emission display.

With respect to Claim 17, the claim is rejected over the reasons stated in the rejection of claims 1 & 13.

With respect to Claim 36, the claim is rejected over the reasons stated in the rejection of claims 1 & 13.

Other Prior Art Cited

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Zimmerman (US 5892323)

Akiyama et al. (US 6914372 B1)

Spindt et al. (US 4857799)

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hana A. Sanei whose telephone number is (571) 272-8654. The examiner can normally be reached on Monday- Friday, 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner
Hana A. Sanei

Karabi Guharay

KARABI GUHARAY
PRIMARY EXAMINER